

SOFT MEDIA BLAST CLEANING TECHNOLOGY

The Need

In September 1996, a demonstration was successfully completed that compared Fernald's baseline D&D debris cleaning system, a high-pressure water cleaning (HPWC) system, and a soft media blast cleaning technology. Fernald's D & D Implementation Plan requires that debris and segmented process components, suitable for disposal in Fernald's on-site disposal facility (OSDF), be cleaned before being placed in the OSDF. Although the baseline cleaning technology functioned well and with few, if any, problems, there were areas of the system's performance that could be improved such as; decreased airborne contamination, decreased shipments of waste to NTS, decreased generation of waste water, and decreased use of protective clothing.



Figure 2. Soft Media Blast Cleaning Technology, AEA Technologies, Inc.

The Technology

The soft media blast system is a variation of the baseline HPWC system; the kinetic energy of the pneumatically propelled soft media impinging on a surface provides the removal mechanism for the surface contaminants. The soft blast media, because of the high transport velocity, impacts the surface with high energy, but due to its soft structure has very little bounce back. On impact the soft media absorbs and traps the contaminants and carries them away from the substrate for easy disposal.

The Demonstration

This demonstration was conducted in Fernald Building 1A adjacent to where the baseline debris cleaning activity was being conducted. The objective of this technology demonstration was to perform a "side-by-side" comparative evaluation between the soft media blast system and the baseline system. The goal being to determine how the soft media blast system performed in comparison to the baseline system when cleaning the D&D debris. The debris material sent to the soft media blast system for cleaning included a significant quantity of tank segments that were contaminated with enriched process residue. Material sent to the baseline system was much more varied, but did not include debris contaminated with enriched residue because criticality control requirements for water cleaning such material cannot be economically justified, and at Fernald this type of material is shipped to the Nevada Test for disposal.

Results

The use of the soft media blast system as a cleaning technology for D&D debris contaminated with non-enriched uranium process residue was not economically competitive with the baseline system. Furthermore, the soft media blast system showed no economic advantage as the size of the cleaning effort increased. Economics, however, favor the use of the soft media blast system as an alternative to the direct shipment to NTS of D&D debris contaminated with enriched process residue when the magnitude of the cleaning project involves more than 2,300 square feet of such D&D debris. Media recycle is possible with this technology, which improves the technology's overall economics. A major obstacle to the implementation of this technology at Fernald is the noise level associated with the system in operation. The noise level for this technology was measured at 110 dBA.